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EXAMINER	
YEH, EUENG NAN	
ART UNIT	**PAPER NUMBER**
2624	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)
	10/787,286	SUGIMOTO ET AL.
	Examiner	Art Unit
	Eueng-nan Yeh	2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 October 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *Oct 5, 2007*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

FINAL ACTION

Response to Amendment

1. The following Office Action is responsive to the amendment and remarks received on October 5, 2007. One new claim, claim 11, is added. Claims 1-11 remain pending. In response to the amendment, the previous specification and claim "objections" are withdrawn.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1 to 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Zakhor et al. (US 5,699,121).

Regarding claims 1 (encoding apparatus) and 5 (encoding program), Zakhor discloses a system comprising:

dictionary storage device configured to store a plurality of bases based on a predetermined two-dimensional function for generating a predetermined two-dimensional pattern (as depicted in figure 1, numeral 80 is a pattern library which "includes a large number of signal patterns" at column 4, line 62; "The pattern library 80 consists of discrete 2-D basis functions (library patterns 82)" at column 8, line 43 and it can be represented by the discrete Gabor function described at column 9, equation (7)), the predetermined two-dimensional function including parameters for curving the predetermined two-dimensional pattern (for the two-dimensional structure "A dictionary set may be composed of these 2-D structures … [e]xamples of the structures defined in Equations 6 and 7 are shown in FIGS. 10-13 … [t]his structure is completely specified by α, β" at Zakhor column 9, line 1. Where the vector parameter α: "$\alpha = (s, \xi, \varphi)$ is a triple consisting respectively of a positive scale, a modulation frequency, and a phase shift. β is defined to be the set of all such triples …" at column 8, line 60; as depicted in figure12, to illustrate one of the two-dimensional contour plots of sample library pattern);

a converter configured to decompose a coding target image by using the plurality of bases on the basis of a predetermined conversion rule (as depicted in figure 1, numeral 60, "the pattern matcher 60 matches selected input patterns with patterns in a pattern library. Preferably, the pattern matcher 60 executes a 'matching pursuits algorithm' …" at column 7, line 38; see also figure 4, numeral 68 and figure 7),

and to convert the coding target image into basis information including index information to a basis used for decomposing the coding target image, a coefficient by which the basis specified by the index information is multiplied, and positional information for specifying a position where a pattern made by multiplying the basis specified by the index information by the coefficient is restored (as depicted in figure 4, numeral 90; see also figure 8 where numeral 92 is an atom parameter signal. "The atom parameter signal segment specifies the best match structure element from the pattern library 80. This element is identified with the values (α, β). The atom parameter signal segment also specifies the location of the best match in the reference frame with (x, y) coordinates. Finally, the atom parameter signal segment specifies the projection of image data at (x, y) onto the selected match element, referred to as 'p'. That is, the best match element from the pattern library is multiplied by a value 'p' ..." at column 5, line 60); and

an encoder configured to generate compression data including a compression code made by encoding the basis information on the basis of a predetermined compression coding rule (as depicted in figure 9, numerals 100 and 102: "The atom coder 100 performs known quantization and variable length coding operations ..." at column 6, line 25, and "Quantization and variable length coding operations are also performed on the motion vector signal by the motion vector coder 102" at column 6, line 35. As illustrated in figure 9, the data will finally go through numerals 104 and 106 to complete the generation of compressed data which includes a compression code).

Regarding claim 2, Zakhor discloses an image encoding method comprising: decomposing a coding target image on the basis of a predetermined conversion rule by using a plurality of bases stored in dictionary storage device (as depicted in figure 1, numeral 60, "the pattern matcher 60 matches selected input patterns with patterns in a pattern library. Preferably, the pattern matcher 60 executes a 'matching pursuits algorithm' ..." at column 7, line 38; see also figure 4, numeral 68 and figure 7),

and converting the coding target image into basis information including index information to a basis used for decomposing the coding target image, a coefficient by which the basis specified by the index information is multiplied, and positional information for specifying a position where a pattern made by multiplying the basis specified by the index information by the coefficient is restored (as depicted in figure 4, numeral 90; see also figure 8 where numeral 92 is an atom parameter signal. "The atom parameter signal segment specifies the best match structure element from the pattern library 80. This element is identified with the values (α, β). The atom parameter signal segment also specifies the location of the best match in the reference frame with (x, y) coordinates. Finally, the atom parameter signal segment specifies the projection of image data at (x, y) onto the selected match element, referred to as 'p'. That is, the best match element from the pattern library is multiplied by a value 'p' ..." at column 5, line 60),

wherein the plurality of bases are based on a predetermined two-dimensional function for generating a predetermined two-dimensional pattern (as depicted in figure 1, numeral 80 is a pattern library which "includes a large number of signal patterns" at

column 4, line 62; "The pattern library 80 consists of discrete 2-D basis functions" at column 8, line 43 and it can be represented by the discrete Gabor function described at column 9, equation (7)), and

the predetermined two-dimensional function includes parameters for curving the predetermined two-dimensional pattern (for the two-dimensional structure "A dictionary set may be composed of these 2-D structures ... [e]xamples of the structures defined in Equations 6 and 7 are shown in FIGS. 10-13 ... [t]his structure is completely specified by α, β" at column 9, line 1. Where the vector parameter α: "$\alpha = (s, \xi, \varphi)$ is a triple consisting respectively of a positive scale, a modulation frequency, and a phase shift. β is defined to be the set of all such triples" at column 8, line 60; as depicted in figure12, to illustrate one of the two-dimensional contour plots of sample library pattern); and generating compression data including a compression code made by encoding the basis information on the basis of a predetermined compression coding rule (as depicted in figure 9, numerals 100 and 102: "The atom coder 100 performs known quantization and variable length coding operations ..." at column 6, line 25, and "Quantization and variable length coding operations are also performed on the motion vector signal by the motion vector coder 102" at column 6, line 35. As illustrated in figure 9, the data will finally go through numerals 104 and 106 to complete the generation of compressed data which includes a compression code).

Regarding claim 3, the predetermined two-dimensional function further includes parameters for making the predetermined two-dimensional pattern move, rotate, and

expand and shrink in two directions ("The pattern library 80 consists of discrete 2-D basis functions (library patterns 82) ..." at column 7, line 43, "The matching pursuits algorithm expands a signal using an overcomplete basis of Gabor functions. The functions are scaled, shifted, and modulated versions of a Gaussian window function" at column 7, line 43; see also column 8, equation 6 is the discrete Gabor functions as a set of scaled, modulated Gaussian windows where the vector parameter α: "$\alpha = (s, \xi, \varphi)$ is a triple consisting respectively of a positive scale, a modulation frequency, and a phase shift. β is defined to be the set of all such triples" at column 8, line 60; see also figure12, to illustrate one of the two-dimensional contour plots of sample library).

Regarding claim 4, the encoding means incorporates the parameters of each of the plurality of bases stored in the dictionary storage device in the compression data (as depicted in figure 9, where the atom coder #100 gets parameters from library pattern match #60 and #80, and then compress it "The atom coder 100 performs known quantization and variable length coding operations. The quantization operation transforms the coefficients of the atom parameter signal into bits ..." at column 6, line 25).

Regarding claim 6 (decoding apparatus) and 10 (decoding program), Zakhor discloses:

dictionary storage device configured to store a plurality of bases based on a predetermined two-dimensional function for generating a predetermined two-

dimensional pattern (as depicted in figure 1, numeral 80 is a pattern library which "includes a large number of signal patterns" at column 4, line 62; "The pattern library 80 consists of discrete 2-D basis functions (library patterns 82)" at column 8, line 43; and can be represented by the discrete Gabor function described at column 9, equation (7)), the predetermined two-dimensional function including parameters for curving the predetermined two-dimensional pattern (for the two-dimensional structure "A dictionary set may be composed of these 2-D structures ... [e]xamples of the structures defined in Equations 6 and 7 are shown in FIGS. 10-13 ... [t]his structure is completely specified by α, β" at Zakhor column 9, line 1. Where the vector parameter α: "$\alpha = (s, \xi, \varphi)$ is a triple consisting respectively of a positive scale, a modulation frequency, and a phase shift. β is defined to be the set of all such triples" at column 8, line 60; as depicted in figure12, to illustrate one of the two-dimensional contour plots of sample library pattern); decode compression data and generate a basis information (as depicted in figure 9, numerals 26 and 110: "The matching pattern decoder 26 performs operations which are the inverse of those performed by the matching pattern coder 22. In particular, the atom decoder 110 performs inverse variable length coding and quantization operations to recover the atom parameter signal ..." at column 6, line 46),

the compression data including a compression code made by encoding the basis information including index information to a basis used for restoring a decoding target image, a coefficient by which the basis specified by the index information is multiplied, and positional information for specifying a position where a pattern made by multiplying the basis specified by the index information by the coefficient is restored (as depicted in

figure 4, numeral 90; see also figure 8 where numeral 92 is an atom parameter signal. "The atom parameter signal segment specifies the best match structure element from the pattern library 80. This element is identified with the values (α, β). The atom parameter signal segment also specifies the location of the best match in the reference frame with (x, y) coordinates. Finally, the atom parameter signal segment specifies the projection of image data at (x, y) onto the selected match element, referred to as 'p'. That is, the best match element from the pattern library is multiplied by a value 'p' ..." at column 5, line 60); and

inverse converter configured to generate the decoding target image by applying a predetermined inverse conversion rule to the basis information decoded by the decoder (as depicted in figures 1 and 9, numerals 80 and 112 under the decoder #26: "The atom parameter signal is then passed to the pattern fetcher 112. The pattern fetcher 112 uses the information in the atom parameter signal to identify a selected pattern in the pattern library 80. The selected pattern is then used to form a coded residual signal" at column 6, line 50. Finally, it will combine with #116 to generate the reconstructed video signals i.e. the decoded target image).

Regarding claim 7, Zakhor discloses:

decoding compression data (as depicted in figure 9, numerals 26 and 110: "The matching pattern decoder 26 performs operations which are the inverse of those performed by the matching pattern coder 22 ..." at column 6, line 46)

including a compression code made by encoding basis information including index information to a basis used for restoring a decoding target image on the basis of a predetermined inverse conversion rule among a plurality of items of index information to a plurality of bases stored in a dictionary storage device, a coefficient by which the basis specified by the index information is multiplied, and positional information for specifying a position where a pattern made by multiplying the basis specified by the index information by the coefficient is restored (as depicted in figure 4, numeral 90; see also figure 8 where numeral 92 is an atom parameter signal. "The atom parameter signal segment specifies the best match structure element from the pattern library 80. This element is identified with the values (α, β). The atom parameter signal segment also specifies the location of the best match in the reference frame with (x, y) coordinates. Finally, the atom parameter signal segment specifies the projection of image data at (x, y) onto the selected match element, referred to as 'p'. That is, the best match element from the pattern library is multiplied by a value 'p' …" at column 5, line 60),

wherein the plurality of bases are based on a predetermined two-dimensional function (as depicted in figure 1, numeral 80 is a pattern library which "includes a large number of signal patterns" at column 4, line 62; "The pattern library 80 consists of discrete 2-D basis functions" at column 8, line 43; and can be represented by the discrete Gabor function described at column 9, equation (7))

which generates a predetermined two-dimensional pattern and includes parameters for curving the two-dimensional pattern (for the two-dimensional structure "A dictionary set may be composed of these 2-D structures … [e]xamples of the structures defined in

Equations 6 and 7 are shown in FIGS. 10-13 … [t]his structure is completely specified by α, β" at Zakhor column 9, line 1. Where the vector parameter α: "$\alpha = (s, \xi, \varphi)$ is a triple consisting respectively of a positive scale, a modulation frequency, and a phase shift. β is defined to be the set of all such triples" at column 8, line 60; as depicted in figure12, to illustrate one of the two-dimensional contour plots of sample library pattern); generating the image to be decoded by applying a predetermined inverse conversion rule to the basis information decoded by the decoder (as depicted in figures 1 and 9, numerals 80 and 112 under the decoder #26: "The atom parameter signal is then passed to the pattern fetcher 112. The pattern fetcher 112 uses the information in the atom parameter signal to identify a selected pattern in the pattern library 80. The selected pattern is then used to form a coded residual signal" at column 6, line 50. Finally, it will combine with #116 to generate the reconstructed video signals i.e. the decoded target image).

Regarding claim 8, the predetermined two-dimensional function further includes parameters for making the predetermined two-dimensional pattern move, rotate, and expand and shrink in two directions ("The pattern library 80 consists of discrete 2-D basis functions (library patterns 82) …" at column 7, line 43, "The matching pursuits algorithm expands a signal using an overcomplete basis of Gabor functions. The functions are scaled, shifted, and modulated versions of a Gaussian window function" at column 7, line 43; see also column 8, equation 6 is the discrete Gabor functions as a set of scaled, modulated Gaussian windows where the vector parameter α: "$\alpha = (s, \xi, \varphi)$ is

a triple consisting respectively of a positive scale, a modulation frequency, and a phase shift. β is defined to be the set of all such triples " at column 8, line 60; see also figure12, to illustrate one of the two-dimensional contour plots of sample library pattern).

Regarding claim 9, the decoder makes the dictionary storage device store the plurality of bases on the basis of parameters for generating each of the plurality of bases included in the compression data (as depicted in figure 8 where numeral 92 is an atom parameter signal: "The atom parameter signal segment specifies the best match structure element from the pattern library 80. This element is identified with the values (α, β). The atom parameter signal segment also specifies the location of the best match in the reference frame with (x, y) coordinates ..." at column 5, line 60; " "the atom decoder 110 *(figure 9)* performs inverse variable length coding and quantization operations to recover the atom parameter signal ..." at column 6, line 48. Once the atom parameter signal is recovered then the plurality of bases for the dictionary storing can be reconstructed because the 2-D basis structure "is completely specified by α and β ..." at column 9, line 14).

Regarding claim 11, Zakhor discloses an image encoding apparatus comprising: dictionary storage means for storing a plurality of bases based on a predetermined two-dimensional function for generating a predetermined two-dimensional pattern (as depicted in figure 1, numeral 80 is a pattern library which "includes a large number of signal patterns" at Zakhor column 4, line 62; "The pattern library 80 consists of discrete

2-D basis functions (library patterns 82)" at column 8, line 43 and it can be represented by the discrete Gabor function described at column 9, equation (7)),

the predetermined two-dimensional function including parameters for curving the predetermined two-dimensional pattern (for the two-dimensional structure "A dictionary set may be composed of these 2-D structures … [e]xamples of the structures defined in Equations 6 and 7 are shown in FIGS. 10-13 … [t]his structure is completely specified by α, β" at column 9, line 1. Where the vector parameter α: "$\alpha = (s, \xi, \varphi)$ is a triple consisting respectively of a positive scale, a modulation frequency, and a phase shift. β is defined to be the set of all such triples …" at column 8, line 60; as depicted in figure12, to illustrate one of the two-dimensional contour plots of sample library pattern);

conversion means for decomposing a coding target image by using the plurality of bases on the basis of a predetermined conversion rule (as depicted in figure 1, numeral 60, "the pattern matcher 60 matches selected input patterns with patterns in a pattern library. Preferably, the pattern matcher 60 executes a 'matching pursuits algorithm' …" at column 7, line 38; see also figure 4, numeral 68 and figure 7),

and converting the coding target image into basis information including index information to a basis used for decomposing the coding target image, a coefficient by which the basis specified by the index information is multiplied, and positional information for specifying a position where a pattern made by multiplying the basis specified by the index information by the coefficient is restored (as depicted in figure 4, numeral 90; see also figure 8 where numeral 92 is an atom parameter signal. "The atom parameter signal segment specifies the best match structure element from the pattern

library 80. This element is identified with the values (α, β). The atom parameter signal segment also specifies the location of the best match in the reference frame with (x, y) coordinates. Finally, the atom parameter signal segment specifies the projection of image data at (x, y) onto the selected match element, referred to as 'p'. That is, the best match element from the pattern library is multiplied by a value 'p' ..." at column 5, line 60); and

encoding means for generating compression data including a compression code made by encoding the basis information on the basis of a predetermined compression coding rule (as depicted in figure 9, numerals 100 and 102: "The atom coder 100 performs known quantization and variable length coding operations ..." at column 6, line 25, and "Quantization and variable length coding operations are also performed on the motion vector signal by the motion vector coder 102" at column 6, line 35. As illustrated in figure 9, the data will finally go through numerals 104 and 106 to complete the generation of compressed data which includes a compression code).

Response to Arguments

4. <u>*Summary of Applicant's Remark:*</u>

The previous specification and claim objections should be withdrawn in view of the amendment.

<u>*Examiner's Response:*</u>

Examiner agrees, and the previous objections are withdrawn.

5. *Summary of Applicant's Remarks*:

"Figure 12 in Zakhor et al. shows a contour plot of the resulting 2-D basis structure, and is not a result of a function being processed (i.e. generated) by predetermined two-dimensional function including parameters for curving the predetermined two-dimensional pattern" at response page 10, line 12.

Examiner's Response:

As stated by Zakhor for the two-dimensional structure "A dictionary set may be composed of these 2-D structures ... [e]xamples of the structures defined in Equations 6 and 7 are shown in FIGS. 10-13 ... [t]his structure is completely specified by α, β" at Zakhor column 9, line 1. Figure12 illustrates one of the two-dimensional contour plots of sample library pattern. Refer to the rejections above.

Conclusion

6. Applicant's amendment is rejected in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eueng-nan Yeh whose telephone number is 571-270-1586. The examiner can normally be reached on Monday-Friday 8AM-4:30PM EDT.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on 571-272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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